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Auditor General of British Columbia

Follow-up of 2004/05 Report 3:

Preventing and Managing Diabetes in British Columbia

December 2007

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The Honourable Bill Barisoff
Speaker of the Legislative Assembly
Province of British Columbia
Parliament Buildings
Victoria, British Columbia
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Dear Sir:

I have the honour to transmit herewith to the Legislative Assembly of British Columbia my 2007/2008 Report 4: Follow-up of 2004/05 Report 3: Preventing and Managing Diabetes in British Columbia.

John Doyle
Auditor General of British Columbia

Victoria, British Columbia
December 2007

copy: Mr. E. George MacMinn, Q.C.
Clerk of the Legislative Assembly

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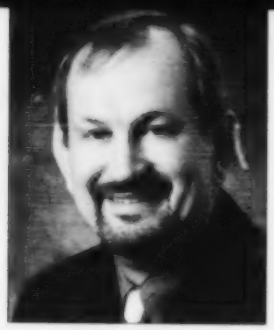
Auditor General's Comments

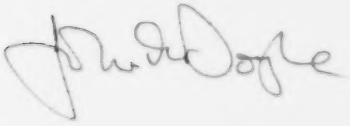


John Doyle
Auditor General

Our approach to completing our follow-up reviews is to ask management of the organizations with responsibility for the matters examined to provide us with written representations describing action taken with respect to the recommendations. We then review these representations to determine if the information reported, including an assessment of the progress made in implementing the recommendations, was presented fairly in all significant respects (Appendix C). For this follow-up report, we concluded that it was.

In this report, we provide a summary of the original report, our overall conclusion, a summary of the overall status of recommendations and the Ministry of Health's response to our request for an accounting of progress. I am pleased that our recommendations have been accepted and that the Ministry has taken initial steps to implement them. I encourage the Ministry of Health to continue in its efforts to fully implement the recommendations.

I wish to express my appreciation to the staff and senior management of the Ministry of Health for their cooperation in preparing the follow-up report, providing the appropriate documentation and assisting my staff throughout the review process.



John Doyle, CA
Auditor General

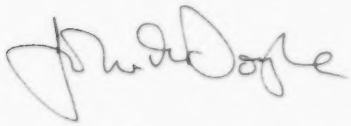
Victoria, British Columbia
December 2007

Report on the Status of Recommendations

This is our report on our follow-up of our recommendations from our 2004/2005: Report 3: Preventing and Managing Diabetes in British Columbia.

Information as to the status of the recommendations was provided to by the Ministry of Health. We reviewed the Ministry's response in August 2007 regarding progress in implementing the recommendations. Our review was made in accordance with standards for assurance engagements established by the Canadian Institute of Chartered Accountants and, accordingly, consisted primarily of enquiry, document review and discussion.

Based on this review, nothing has come to our attention to cause us to believe that the Ministry's progress report does not present fairly, in all significant respects, the progress made in implementing the recommendations contained in our 2004/2005 Report 3: Preventing and Managing Diabetes in British Columbia.



John Doyle
Auditor General

December 2007

Audit Purpose and Scope

The purpose of the audit was to assess whether British Columbians are receiving value for money from the health care system's efforts to prevent and manage diabetes.

We looked at how the system was doing at each of the stages of diabetes: primary prevention, early detection, and diabetes management. For prevention, we looked at how well the health ministries and health care system were doing at educating and encouraging individuals at risk of developing diabetes to make lifestyle choices to reduce their risk, and encouraging policies and practices that support and encourage such choices. We also determined whether B.C. has systems and processes in place that result in early diagnosis and effective care for people with diabetes. Finally, we assessed whether the Province was effectively monitoring and reporting on the ability of the health care system to achieve positive health outcomes related to diabetes.

This audit focused primarily on the roles played by the Ministries of Health and the Health Authorities in preventing and managing diabetes in B.C.. In conducting our audit, we focused our attention on the policies, programs, management practices and information in existence during the fiscal years 2002/03 to 2003/04, up to December 31, 2003. We also included information from earlier years if more current information was unavailable.

Overall Conclusion

We concluded that current British Columbia efforts to prevent and manage diabetes are praiseworthy but inadequate to address the problem.

Preventing and Managing Diabetes in British Columbia
Original Issue Date: October 2004
Year Followed Up: 2007

Summary of Status of Recommendations as at June 30, 2007	
Total Recommendations	3
Fully Implemented	
Substantially Implemented	
Partially Implemented	3
Alternative Action	
No Action	
Follow-up Required	3

Recommendations Requiring Follow-up

We recommend that the provincial government engage in an organized process to:

1. **Search out potentially effective and research-supported methods of preventing diabetes and its consequences, and determine through pilot projects or other means the effectiveness of these methods when applied in British Columbia.**
2. **Develop, and provide to Cabinet, well-supported strategies for prevention, including documentation of the costs and benefits (in medical, social and financial terms) of applying the recommended methods of prevention, and of not doing so.**
3. **Implement the strategies chosen by Cabinet in such a way that they can achieve their optimum effectiveness and be sustained long enough to be effective.**

Ministry of Health
Summary of Status of Implementation by Recommendation
2004/2005 Report 3: Preventing and Managing Diabetes in British Columbia
As at June 30, 2007

Office of the Auditor General of British Columbia Recommendations	Implementation Status				
We recommend that the provincial government engage in an organized process to:	**Fully**	**Substantially**	**Partially**	**Alternative Action**	**No Action**
Search out potentially effective and research-supported methods of preventing diabetes and its consequences, and determine through pilot projects or other means the effectiveness of these methods when applied in British Columbia.			√		
Develop, and provide to Cabinet, well-supported strategies for prevention, including documentation of the costs and benefits (in medical, social and financial terms) of applying the recommended methods of prevention, and of not doing so.			√		
Implement the strategies chosen by Cabinet in such a way that they can achieve their optimum effectiveness and be sustained long enough to be effective.			√		

Response from the Ministry of Health
As at June 30, 2007

Introductory Statement:

In October 2004, the British Columbia Office of the Auditor General issued the report, the *Prevention and Management of Diabetes in British Columbia*. In 2007, the Office of the Auditor General (OAG) requested an update on the status of the implementation of the recommendations issued in the report.

The following provides an overview of diabetes in B.C., followed by a summary of how the Ministry has responded to the OAG recommendations in the years following the issue of the report recommendations.

It should be noted that diabetes is a multifaceted, societal problem — requiring action by government, public institutions, communities, and individuals, as well as, the health system.

The B.C. Ministry of Health also recognizes that in order to address the health care needs of the chronically ill patients, B.C.'s health system must continue to change from its predominately acute/episodic orientation, to a more planned approach to care provision aligned with the direction of the Ministry's Service Plan, the Medical Services Division's Strategic Plan, health authority plans, and the Government/B.C. Medical Association 2006 Agreement.

To this end, the Ministry launched its Primary Health Care (PHC) Charter for British Columbia in May 2007. The PHC Charter sets out the Ministry's long-term strategic direction for B.C.'s primary health care system across regional health authorities. In addition, the PHC Charter also sets out a strategic agenda for other key stakeholders who want to align their efforts to a systems approach. The Charter recognizes that a broader societal approach to shifting the health care system is particularly relevant to the prevention and management of diabetes insofar as the broader determinants of health impact diabetes onset and the health status of people living with this chronic illness.

Response from the Ministry of Health

Due to data availability, many of the data analyses reported in this response pertain to the time period ending 2004/05[1]. The impacts of the system shifts occurring through the implementation of the PHC Charter will therefore be captured in data gathered post 2007/08 fiscal year.

In the interim, this response will describe how the B.C. Ministry of Health has invested in both preventing the onset of diabetes through targeting the societal issues underlying this chronic illness, and in preventing the complications of diabetes through building capacity at the community level for improved chronic disease management.

The importance of re-orienting the health care system from a reactive approach to the delivery of a more planned approach to health care results for improved diabetes management will be discussed, along with preliminary results indicating that province-wide implementation of the chronic care model needs to be accelerated in order to realize it full potential benefits.

Diabetes in B.C.

The Burden of Diabetes

In 2004/05 approximately, 234,277 British Columbians have been diagnosed as having diabetes. If not kept under control, diabetes imparts significant burden to both the patient and the health care system. For example, complications of diabetes include cardiovascular disease, kidney disease, damage to sight, and limb amputation. It is estimated that the direct costs for diabetes to the healthcare system in B.C., including hospitalization, Medical Services Plan and PharamCare costs were approximately $1.04 billion in 2003/04. These costs could rise to $1.9 billion by 2015/2016. However, if prevention initiatives can reduce the incidence of diabetes by just 25 per cent, it is estimated that an annual savings of over $200 million could be realized within twelve years (Figure 1).[2]

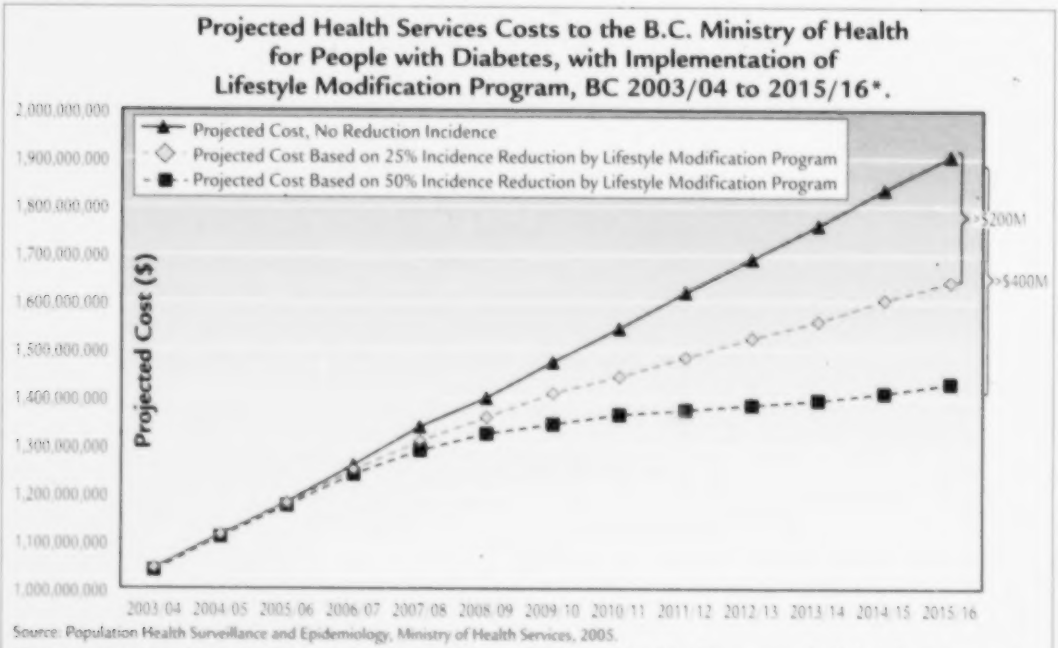
---

1 The most current and complete year for identifying people with diabetes is 2004/05. Although the diabetes register includes data to March 31, 2006, those who meet the case definition with 2 physician claims in 365 days and who have their first physician claim prior to March 31, 2006 and their second physician claim after March 31, 2006 will not be included in the register until the next update. Thus, the number of new cases of diabetes will be incomplete in 2005/06.

2 The Impact of Diabetes on the Health and Well-Being of People of British Columbia, Provincial Health Officer's Annual Report 2004.

Figure 1:

Projected Health Services Costs to the B.C. Ministry of Health for People with Diabetes. With Implementation of Lifestyle Modification Program, B.C. 2003/04 to 2015/16[1]


Projected Health Services Costs to the B.C. Ministry of Health for People with Diabetes, with Implementation of Lifestyle Modification Program, BC 2003/04 to 2015/16*.
Projected Cost, No Reduction Incidence
Projected Cost Based on 25% Incidence Reduction by Lifestyle Modification Program
Projected Cost Based on 50% Incidence Reduction by Lifestyle Modification Program
Projected Cost ($)
2,000,000,000
1,900,000,000
1,800,000,000
1,700,000,000
1,600,000,000
1,500,000,000
1,400,000,000
1,300,000,000
1,200,000,000
1,100,000,000
1,000,000,000
>$200M
>$400M
2003/04 2004/05 2005/06 2006/07 2007/08 2008/09 2009/10 2010/11 2011/12 2012/13 2013/14 2014/15 2015/16

Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2005.

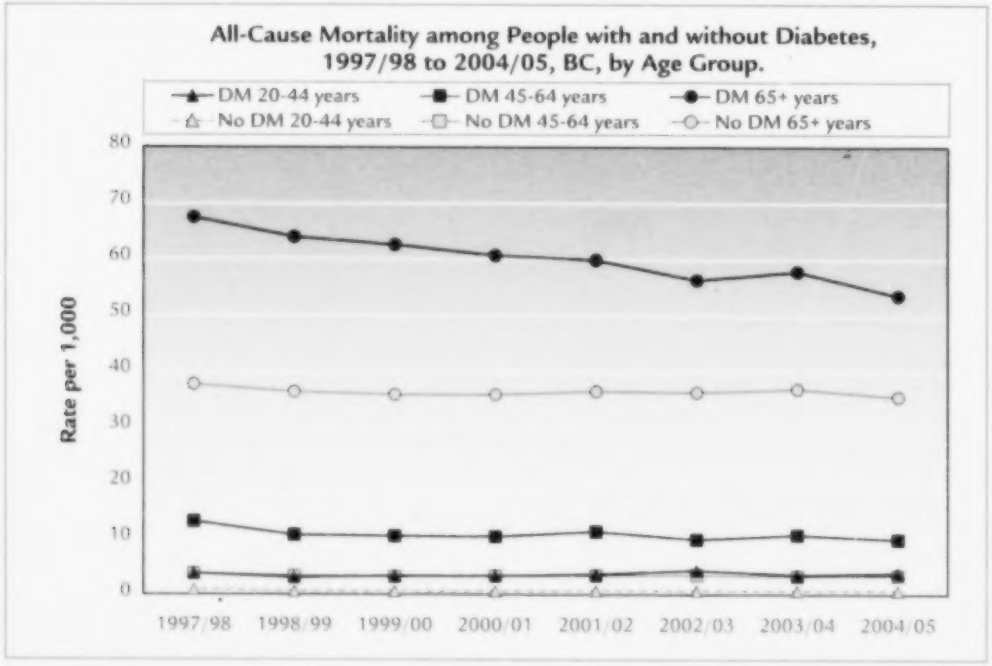
*For the purpose of this analysis, the resulting estimates were modeled from a widely reported study involving a nutritional and physical activity intervention for non-diabetics at risk of developing diabetes (Diabetes Prevention Program Research Group, 2002). It must be acknowledged that the results of a specific clinical trial are not necessarily attainable at the population level, but can assist in the development of goals for a population prevention strategy.

Response from the Ministry of Health

Diabetes Prevalence[3]

The prevalence of diabetes in B.C. has grown from 44 people with diabetes per every 1,000 people in the general population in 1997/98 to 71 per every 1,000 in 2004/05, a 61% increase. This means that there were 129,114 people in B.C. with diabetes in1997/98 and this increased to 234, 277 people with diabetes by 2004/05, an increase of 105,163. A large portion of this increased prevalence is likely attributable to the fact that more people with diabetes are now living longer. That is, in B.C., all-cause mortality among people with diabetes who are 65 years and older has declined by 22% since 1997/98 (Figure 2). For example, for people with diabetes, mortality rates dropped by a rate of 14 people per every 1,000 between the years 1997/1998 and 2004/2005 (compared to a decrease of 2 per 1,000 among people without diabetes). Moreover, mortality among people with diabetes younger than 65 years of age has remained constant between the years 1997/98 and 2004/05.

Figure 2:

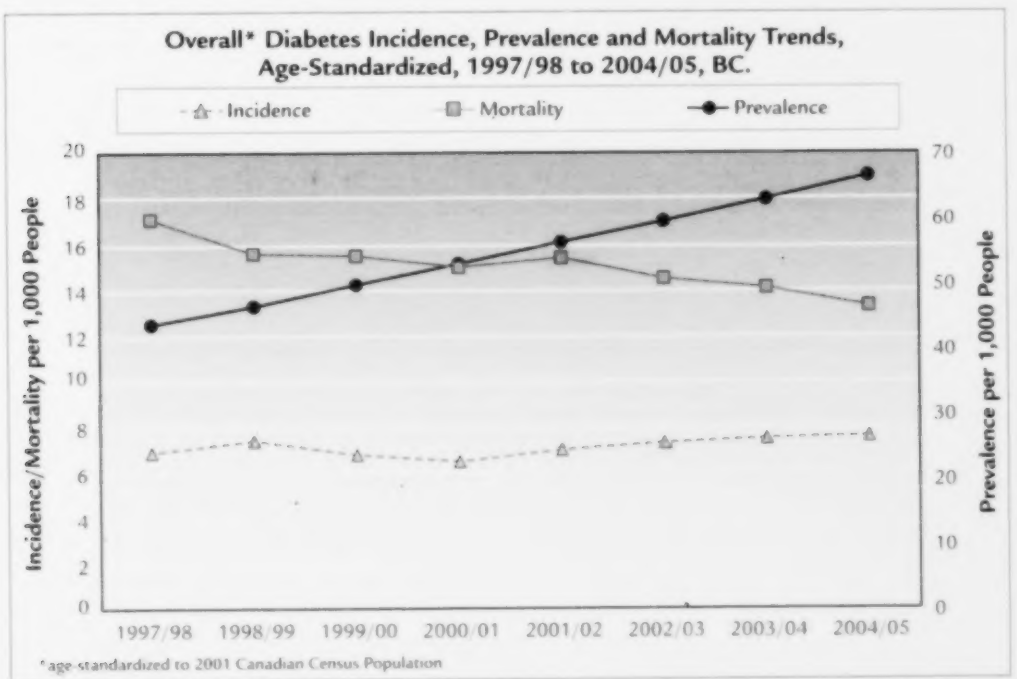


[3] Prevalence refers to the total number of cases of a disease in a given population at a specific point in time.

Diabetes Incidence[4]

At the same time, the overall incidence rate of diabetes has increased from 6.7 people for every 1,000 people in the general population to 8.8. When these rates are age standardized the incidence rate increases from 6.8 people for every 1,000 people in the general population to 8.7 per 1,000 between the years 1997/98 and 2004/05 (Figure 3), a 28% increase. The similarity between the crude and standardized rates shows that the aging of B.C.'s population in and of itself does not account for a large part of the increase in incidence. These rates can be translated into actual numbers of people newly requiring care for diabetes. In 1997/98, there were 19,078 people who were first diagnosed with diabetes that year. In 2004/05, there were 25,984 people who were newly diagnosed, a difference of 6,906 cases in the annual number between 1997/98 and 2004/05.

Figure 3:



[4] Incidence is the number of new cases of a disease in a population over a period of time.

Response from the Ministry of Health

Diabetes Screening

It is possible that the increase in diabetes incidence rates observed after 2003/04 reflects an increase in case finding/screening by general practitioners due to the introduction of an incentive payment in September 2003 whereby B.C. full service family practice physicians were eligible to receive a financial bonus for their patients who received diabetes care in accordance with B.C. diabetes management guideline recommendations. Statistics show that family physicians were more likely to bill the incentive payment for their older patients, than younger patients which parallels the natural course of the disease—this difference tends to correspond with differential increased case finding in the population 65 years and older as opposed to younger adults. A contributing factor could also be the change in the clinical definition of diabetes mellitus from7.8 mmol/L to 7.0 mmol/L in 1998 which may have resulted in an increase in the number of people being diagnosed with diabetes. Finally, the increased incidence may be reflective of increased disease related to population level changes in the rates of healthy eating, active living, and obesity.

Due to the serious long-term consequences of diabetes, it is important to detect the disease early in order to prevent or delay damage to the heart, kidney, nerves, blood vessels, or eyes. Type 2 diabetes can develop slowly over a period of years, and during this time a person may not know that they have diabetes and are unaware of the damage that might be occurring. As such, screening for diabetes among high risk populations is recommended.

According to B.C. clinical guidelines for diabetes management, people 40 years and older who are not at high risk for Type 2 diabetes should receive one fasting plasma glucose or glucose tolerance test every three years (with earlier testing if the person is at risk for developing Type 2 diabetes).

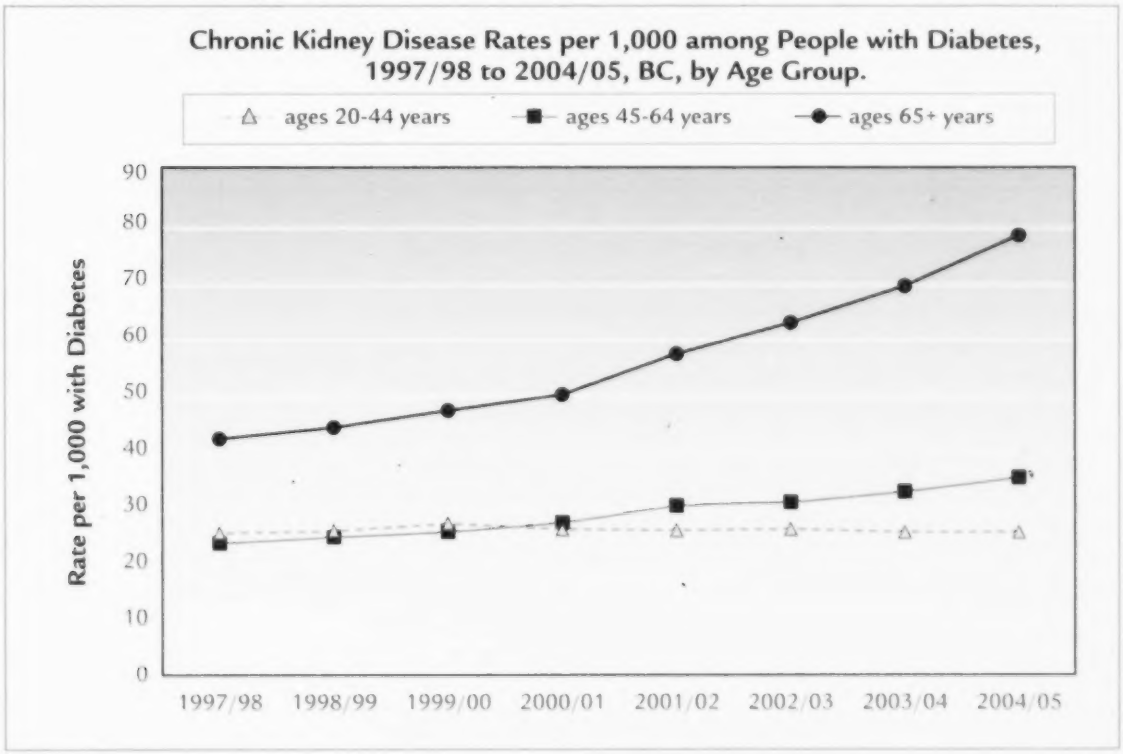
In British Columbia over 85% of men and women over 45 years of age have been screened for diabetes indicating that the B.C. diabetes management clinical guideline screening recommendations are being well adhered to in this province. This adherence to guideline recommendations, and the resulting case finding, could be contributing to the increases in diabetes incidence rates.

Complications of Diabetes

The statistics indicate that British Columbians living with diabetes have complex health care needs, insofar as they often also have co-morbid conditions such as chronic kidney disease (CKD), hypertension (HTN), and cardiovascular disease (CVD).

As shown in Figure 4, the number of people over the age of 65 who have both diabetes and chronic kidney disease has nearly doubled from 42 people per every 1,000 in 1997/98 to a rate of 78 per every 1,000 in 2004/05. After adjusting for age, the chronic kidney disease rates increased by 34%, indicating that aging of the population is not the only driver of increases in new cases of chronic kidney disease. The rising rates of new CKD cases may be due to earlier detection of CKD insofar as the rates began rise around the same time as the CKD initiatives (described below) were implemented.

Figure 4:

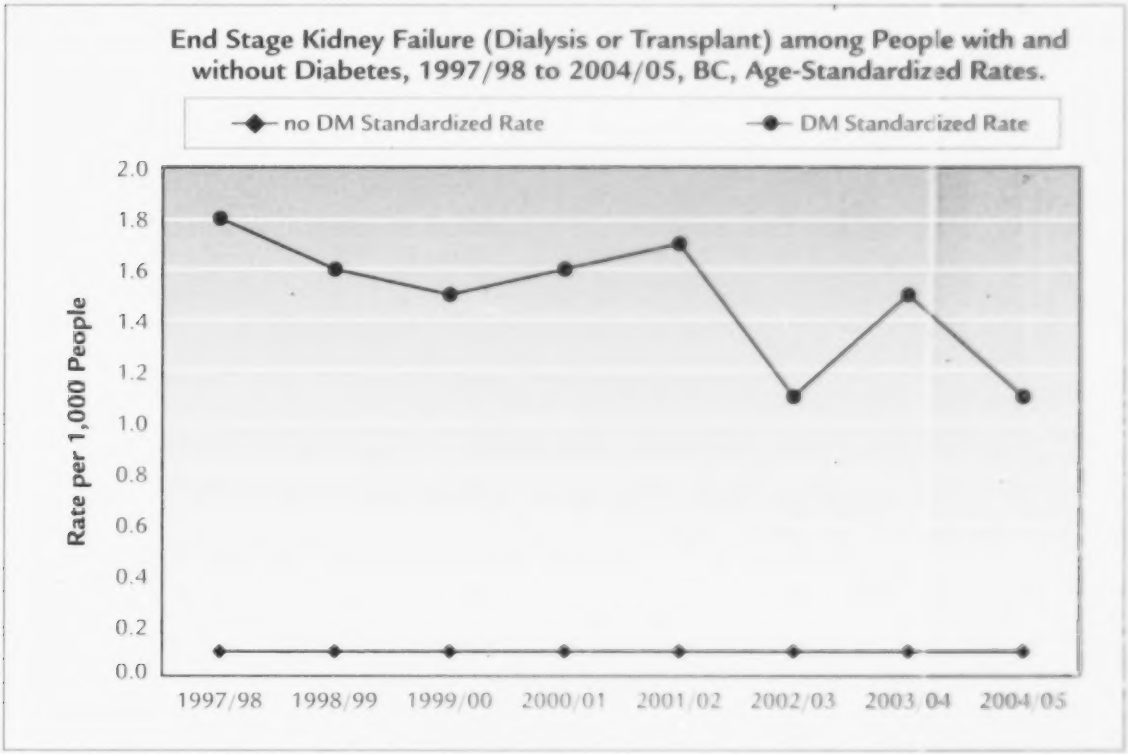


It is important to note, however, despite the rising rate of kidney disease among people with diabetes, rates of kidney failure have dropped by 38% between 1997/98 and 2004/05 (Figure 5). At the same time, kidney failure increased 9% for people who do not have diabetes.

The low rate of new dialysis starts relative to the large increase in kidney disease likely reflects the introduction of the chronic care model for chronic kidney disease in B.C. Through the leadership of the B.C. Ministry of Health and the BC Renal Agency, the following supports aimed at helping to slow the progression of this disease towards end stage renal disease (requiring chronic kidney dialysis or transplant) were made available to B.C.'s general practitioners:

- Province-wide lab strategy whereby B.C. laboratories now report estimated glomerular filtration rates in addition to serum creatinine for a more accurate measure of kidney function; and
- B.C. Chronic Kidney Disease clinical guidelines and patient flow sheet that provide evidence based recommendations on the management of kidney disease that slows the progression of the disease.

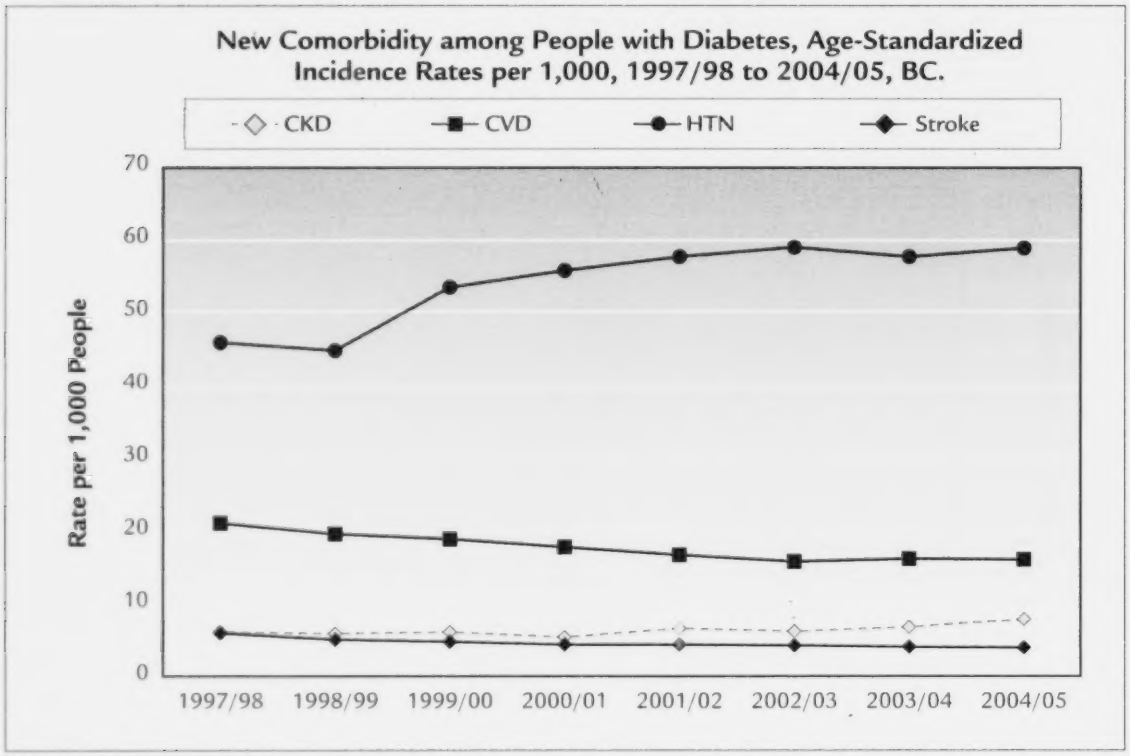
Figure 5:



As shown in Figure 6, after adjusting for age, the rate of new cases of cardiovascular disease dropped by 24% for both people with diabetes at a rate of 5 per 1,000 for people with diabetes and 2 per 1,000 for people without diabetes. The rate of new strokes decreased by 33% among people with diabetes, in comparison to a 13% decrease among people who did not have diabetes.

Statistics also indicate that the number of people being newly diagnosed with hypertension is increasing. Between 1997/98 and 2004/05, the number of new cases of hypertension increased by 28% for people with diabetes (at a rate of 15 people per 1,000). Similarly, new cases of hypertension increased by 26% among people who did not have diabetes (at a rate of 5 people per 1,000).

Figure 6:


New Comorbidity among People with Diabetes, Age-Standardized Incidence Rates per 1,000, 1997/98 to 2004/05, BC.
CKD
CVD
HTN
Stroke
Rate per 1,000 People
70
60
50
40
30
20
10
0
1997/98
1998/99
1999/00
2000/01
2001/02
2002/03
2003/04
2004/05

Response from the Ministry of Health

Progress on Implementing the Recommendations

We recommend that the provincial government engage in an organized process to:

1. **Search out potentially effective and research-supported methods of preventing diabetes and its consequences, and determine through pilot projects or other means the effectiveness of these methods when applied in British Columbia.**

Status: Partially implemented — Ongoing

Primary Prevention (Strategic Population Health Initiatives)

Diabetes is a chronic condition that results from the body's inability to sufficiently produce or use insulin. Of the three types (Type 1, Type 2 and gestational diabetes), the most common is Type 2, which accounts for more than 90 per cent of diagnosed cases. Risk factors include overweight and obesity, and physical activity.[5]

The B.C. Ministry of Health does not have a diabetes-specific prevention strategy; rather, diabetes prevention is addressed through an integrated, risk factor-based strategy that seeks to prevent most prevalent chronic disease categories, including Type 2 diabetes, cardiovascular disease, chronic respiratory disease and cancer, by targeting the risk factors that are common to them all; tobacco use, physical inactivity, poor nutrition and overweight/obesity.

The Ministry's role in chronic disease prevention is one of stewardship: the Ministry sets direction and provides a framework of legislation, regulation, monitoring and evaluation to ensure a robust system of investment, program delivery and awareness-raising is in place to help British Columbians make healthy lifestyle choices, and avoid the chronic diseases that impact quality of life, increase morbidity and mortality, and threaten the sustainability of the health care system.

[5] Food, Health and Well-Being in British Columbia, Provincial Health Officer's Annual Report 2005

Response from the Ministry of Health

There are two significant initiatives that support the Government's population-based approach to chronic disease prevention, including prevention of diabetes:

i. a framework for the development, delivery, measurement and evaluation of evidence-based core public health functions in B.C.; and

ii. an integrated, risk-factor based, chronic disease prevention strategy (ActNow BC)

i. Core Public Health Functions in B.C.

Core public health functions are primordial, primary and early secondary prevention activities of a comprehensive health system. Since 2002/03, the Ministry has been working with the Health Authorities to redefine and implement the core public health functions in B.C. In March 2005, *A Framework for Core Functions in Public Health* was released (See http://www.health.gov.bc.ca/prevent#core), identifying 21 different program areas. The program areas of Healthy Communities, Healthy Living, and Food Security support healthy, active communities and the creation of environments where people are encouraged to be more active and make healthier food choices, and are therefore most closely related to the prevention of diabetes and other chronic diseases.

The core public health functions are being implemented through a performance improvement process over a number of years. Health Authorities are participating in the definition of model core programs for all program areas, based on best available evidence and best practice. Once the model core programs are approved, the Health Authorities will develop their own public performance improvement plans, with targets, tailoring their actions to the unique needs of their populations. These plans will be reviewed by the Ministry, and made public to ensure the Health Authorities are accountable to their communities.

Response from the Ministry of Health

Through 2006/07, Health Authorities developed performance improvement plans for Food Security. Food Security is a concern as diabetes is more prevalent in food insecure populations.[6] Obesity occurs at a higher rate in low income children and adults and in Aboriginal populations.[7] Food-insecure diabetics have more costly and life-threatening complications to their illness and require greater levels of care.[8] The Food Security performance plans are tailored to Health Authority needs and priorities, but focus on components such as development of regional food policy frameworks, and an appropriate array of programs and services at the community level.

Health Authorities are currently engaged in development of needs assessment, gap analysis and performance improvement planning of policies and services related to Healthy Living and Healthy Communities. The focus is on increasing systemic supports for "making the healthy choice the easy choice" at the individual, family and community level, preventing and reducing the high-risk behaviours of unhealthy eating and physical inactivity, particularly in young people and vulnerable populations, and enhancing surveillance, monitoring and evaluation of healthy living trends and interventions. It is anticipated that the Health Authorities' performance improvement plans will include strategies such as development of partnerships to create healthy schools and workplaces, and strategies to engage in advocacy within communities to promote involvement in addressing these issues. The Ministry has facilitated the work to support healthy communities and healthy living through ActNow BC initiatives such as Action Schools and Active Communities.

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6 Vozoris, N.T., and Tarasuk, V.S. 2003. Household food insufficiency is associated with poorer health. *Journal of Nutrition* 133 (1):120-126.

7 Riches, G., Budkingham, D., MacRae, R., and Ostry, A. 2004. *Right to food case study:* Canada. Rome: Food and Agricultural Organization of the United Nations

8 Vozoris, N.T., and Tarasuk, V.S. 2003. Household food insufficiency is associated with poorer health. *Journal of Nutrition* 133 (1):120-126.

ii. ActNow BC: Government's Chronic Disease Prevention and Health Promotion Strategy

Research has shown that most preventable chronic diseases, including diabetes, have their roots in unhealthy lifestyles or environments and, in particular, in four main risk factors: physical inactivity, unhealthy eating, overweight/obesity, and tobacco use. Chronic disease surveillance has shown that many diabetics also have other chronic diseases associated with the same risk factors.

ActNow BC is an integrated chronic disease prevention strategy that addresses the most common chronic disease categories — diabetes, cardiovascular disease, chronic respiratory disease, and some types of cancer — by targeting the high-risk lifestyle behaviours common to them all, as described above. By encouraging people to make healthier lifestyle choices and promoting the creation of health-supporting environments, ActNow BC seeks to reduce the incidence of preventable chronic diseases, including diabetes.

ActNow BC adopts a best practice approach that is comprehensive, multi-sectoral, partnership-based, results-focused and measurable. By engaging British Columbians where they live, learn, work and play, ActNow BC extends responsibility for population health beyond the healthcare sector and takes advantage of the reach and resources of non-traditional sectors like transportation, agriculture, forests and labour.

Some examples of programs in place that are helping British Columbians make healthier choices to be more physically active and eat more nutritious foods, thereby reducing their risk of developing Type 2 diabetes, include:

- **Action Schools! BC:** a best practices activity model aimed at increasing activity levels of students, and creating health supporting environments in schools. A Healthy Eating component is helping to raise awareness of the importance of healthy food choices.
- **Active Communities:** a program to help communities to increase activity levels of the people in their communities.
- **The School Fruit and Vegetable Program:** providing a healthy vegetable or fruit snack to students twice a week, raising awareness of the importance of healthy eating and introducing students to more fruit and vegetable options.

- **The School Food and Beverage Sales Guidelines:** helping schools ensure students have access to the healthiest food options, and less access to high calorie foods and beverages that contribute to unhealthy weight gain. The Public Buildings Food and Beverage Sales Guidelines extend the policies for school food sales to public buildings. These are being adapted for recreation centres. The goal is to reduce availability of junk food, and ensure that British Columbians have access to healthy food options wherever they are.
- **The Community Food Action Initiative:** providing grants to communities to identify and address their food security needs.

A social marketing campaign is raising awareness of the ActNow brand and encouraging individuals, in particular children, to be more physically active. A second phase of the campaign, expected to roll-out in September 2007, will highlight the importance of healthy eating.

ActNow BC's success will be measured in terms of the 2010 targets: reducing tobacco-use by 10%; increasing the percentage of B.C. adults who are moderately or physically active by 20%; increasing the percentage of B.C. adults who eat five or more servings of fruits and vegetables per day by 20%; and increasing the percentage of women counselled on the dangers of alcohol use in pregnancy by 50%.

Measuring Our Success, the ActNow BC baseline document, identifies the baseline measures of 2004/05. Regular published reports will monitor progress toward the targets.

While ActNow BC is an integrated approach that addresses the spectrum of the most common chronic disease categories, the majority of the programs and services specifically target the risk factors of inactivity, poor nutrition, and overweight and obesity. It is expected that by promoting healthy lifestyle choices and reducing unhealthy behaviours associated with these risk factors, ActNow BC will help address the growing incidence of Type 2 diabetes.

More information about ActNow BC can be found at http://www.actnowbc.ca/ . A discussion of the monitoring and evaluation framework for ActNow BC and its program and services is documented in the report *Measuring Our Success*.

Response from the Ministry of Health

Prevention Support Program

The Prevention Support Program, a province-wide initiative that included 50 physicians and 35 nurses with 13 Nurse Facilitators/Coordinators, was pilot tested in 2005/06 through an Evidenced-based "Prevention" Structured Collaborative. A clinical guideline on primary prevention of cardiovascular disease — including guidelines for providing advice, counselling and referral regarding diet and activity — is being developed by the Guidelines and Protocols Advisory Committee (GPAC, co-chaired by the BCMA and the Medical Services Plan). As well, a new prevention fee through MSP will support services offered under the new guideline once it is completed. By supporting individuals to reduce their risk factors and therefore their risk of cardiovascular disease in particular, this initiative supports government's work to address chronic disease in general, including diabetes.

Secondary Prevention: Preventing the Consequences of Diabetes

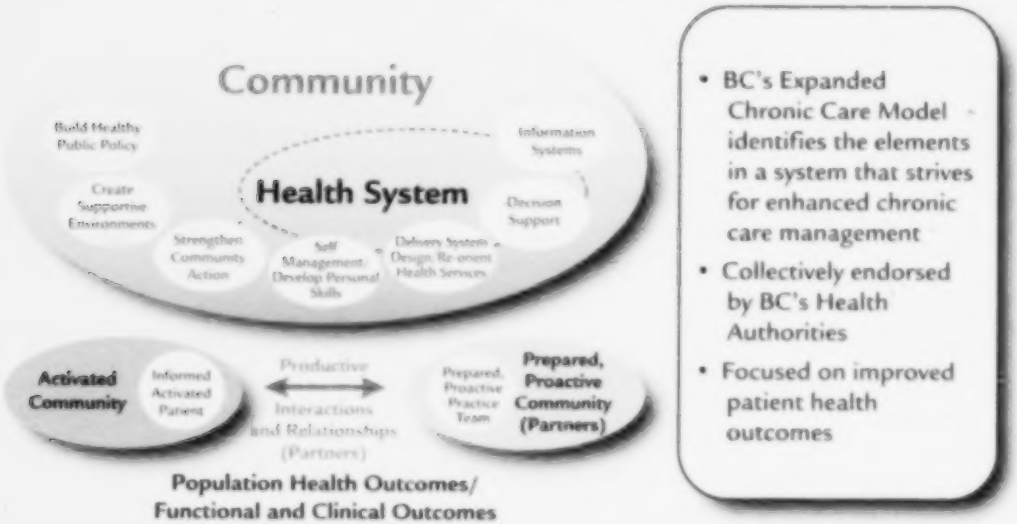
Diabetes is associated with a cluster of serious complications, including coronary heart disease, kidney, nerve or retinal change, and ultimately, premature death. Procedures such as: coronary bypass, angioplasty, kidney dialysis, retinal surgeries and lower limb amputation may be required to repair damage that could have been lessened or prevented by early diagnosis and good diabetes care.

Starting in 2002, the MOH used administrative data to develop a diabetes patient register in order to identify the number of British Columbians living with diabetes and the extent to which they were receiving evidence-based diabetes care. Analyses showed a gap between recommended diabetes care and the care patients were actually receiving.

In order to close gaps in care, MOH adopted the Chronic Care Model for province-wide implementation. The research literature has reported that implementation of all the model's components invariably results in improved care and ultimately patient outcomes. B.C. adapted the model to add the social determinants of health and community supports to be more appropriate for the Canadian context. This has now become known internationally as the Expanded Chronic Care Model (Figure 7). The Expanded Chronic Care Model integrates a number of strategies to enhance outcomes for patients with chronic illnesses.

Figure 7:

Expanded Chronic Care Model[1]


Community
Build Healthy Public Policy
Create Supportive Environments
Strengthen Community Action
Health System
Information Systems
Decision Support
Self Management Develop Personal Skills
Delivery System Design Re-orient Health Services
Activated Community
Informed Activated Patient
Productive Interactions and Relationships (Partners)
Prepared, Proactive Practice Team
Prepared, Proactive Community (Partners)
Population Health Outcomes/ Functional and Clinical Outcomes
• BC's Expanded Chronic Care Model identifies the elements in a system that strives for enhanced chronic care management
• Collectively endorsed by BC's Health Authorities
• Focused on improved patient health outcomes

To date, B.C. has implemented the Expanded Chronic Care Model components[1] into the health care system as follows:

Decision Support: The following were made available to all B.C. general practitioners through a direct-mail out and posting on the Ministry and B.C. Medical Association websites.

- **Clinical Guidelines Development** – The B.C. Diabetes Management Guidelines (developed through the MSP/BCMA Guidelines and Protocols Committee) identify recommended diabetes care based on the best scientific evidence currently available.
- **Patient Flow Sheets** – The Diabetes Care patient flow sheet (which is part of the B.C. Diabetes Management Guideline) is a useful tool for summarizing clinical information important in effective diabetes management.

[1] Primary prevention components of the Chronic Care Model (capture through ActNow and the Core Public Health Functions are *Building Health Public Policy, Create Supportive Environments, and Strengthen Community Action*

Information Technology

- **Diabetes Patient Register** was developed through administrative data to identifying the population of patients with diabetes, and to accurately monitor of the quality of patient care and population health status.
- **The *CDM Toolkit*** information technology gives general practitioners easy access to B.C. Clinical Guidelines, and a patient reminder and recall system. It also includes electronic versions of the B.C. Diabetes Patient Flow Sheets, the CDM Toolkit enables members of practice networks to securely share information (including consult notes and referral letters) needed to ensure continuity of patient care.

Patient Self-Management

Patients as partners are key to improved patient outcomes. People who have a chronic disease need to make daily decisions and take action to control pain and fatigue, use medications properly, and incorporate diet, exercise and stress reduction into their daily routines.

Resources available to help empower people to become experts in managing their health include the Ministry of Health's BC NurseLine, BC HealthGuide and the BC Dial-A-Dietician Program. In addition, the BC Diabetes Care Guidelines includes a patient guide and community resource list designed to encourage and support self-management.

To date, the Ministry has provided $2 million to the University of Victoria Centre on Aging to make the evidence-based Chronic Disease Self Management Program available across the province. This program helps people develop the self-efficacy skills needed to care for their own health and better cope with emotional, social and physical effects of chronic illness.

The Ministry also funded the BC College of Family Physicians to develop and deliver a GP office based patient self management program aimed at training family physicians in how to assist patients in setting their self management goals. In addition, as part of the 2007/08 Practice Support Program, B.C. GPs can access training on how to engage patients to actively participate in the management of their chronic illness.

Delivery System/Design/Re-Orient Health System

The goal of quality improvement activity is to change knowledge, attitudes and behaviour of health care professionals and consumers to achieve better patient health outcomes. B.C. physicians are working hard to provide good chronic care to patients. While the majority of B.C. doctors have their clinical practices perfectly set up to meet their patients' episodic and acute care needs, many practices do not have a system in place to support optimal chronic disease management. *Practice redesign* focuses on supporting family physicians, their practice staff and other health professionals to be innovative, improve and sustain practice changes that result in better professional satisfaction and improved patient health outcomes. Activities implemented in B.C. to support practice re-design were:

(1) *Alignment of physician compensation for improved chronic disease management:* Through the Full Service Family Practice Incentive Program, B.C. GPs are eligible to receive a $125 per patient/per year payment for each patient with diabetes managed to best practice guidelines. This payment remunerates GPs for the non-direct patient care involved in reviewing the patient's chart and undertaking a planned, proactive approach to diabetes management.

(2) *Structured Collaboratives:* The MOH, with the health authorities, has used best practice quality improvement methodology of Plan/Do/Study/Act, to implement guidelines based diabetes care through a structured collaborative process, to enhance management of chronic disease at the primary care level. The initial pilot collaborative that focused on congestive heart failure resulted in improved processes of care for patients, as shown below. The success of this initial structured collaborative led to the implementation of ten collaboratives involving approximately 1,100 practitioners across the province in diabetes management quality improvement.

(3) *The Practice Support Program:* (launched in May 2007) is funded through the 2006 Ministry of Health/B.C. Medical Association Agreement. This is a provincially coordinated, 2-year practice enhancement program in which physician champions will work in partnership with local family physicians and health authority staff in realigning health care services to attain

better patient health outcomes, and improve practitioner professional satisfaction. Through the program, GPs can access training in the following areas of practice redesign:

1. Advanced Access – a new way of scheduling appointments that ensures patients see their physicians closer to the time they need an appointment.
2. Group visits – GPs and their office staff can offer care, education and advice in a group setting that is efficient for the practice, and supportive for patients. Patients benefit from the opportunity to learn from, and share their experiences with their peers.
3. Chronic disease management – developing patient registries to help identify patients with chronic conditions; using a planned recall approach to proactively monitor the care based on the clinical guidelines recommendation; and using the CDM Toolkit to help track progress and patient outcomes.
4. Patient self-management – helping GPs support patients to set and work toward their own health goals, in addition to managing the medical aspects of the patients' illnesses.

With respect to the impact of implementing the Expanded Chronic Care model in B.C., an analysis of the administrative data shows that while areas for improvement still exist, improvements have accrued in some areas.

Provision of Evidenced-Based Recommended Diabetes Care

The A1c test is used primarily to monitor the glucose control over time. The goal is to keep their blood glucose levels as close to normal as possible as this helps to minimize the complications caused by chronically elevated glucose levels, such as progressive damage to body organs like the kidneys, eyes, cardiovascular system and nerves. The A1c test gives a picture of the average amount of glucose in the blood over the last few months. It can help a patient and his doctor know if the measures they are taking to control the patient's diabetes are successful or need to be adjusted. The BC diabetes management guidelines recommend that people with diabetes should have their A1c levels tested three times

per year. The number of British Columbians with diabetes who received guidelines recommended A1c testing has doubled from 61,742 in 200/01 to 120,990 in 2006/07.

As shown in Table 1, the number of people with diabetes who are being tested in accordance with clinical guidelines varies according to age. For example, among those 45 years and older, A1c testing rates doubled from 40.2% in 1997/98 to 85.8% in 2004/05. However, for those people ages 20-44 years, A1c testing rates increased only slightly from 27.2% to 29%

Table 1: Testing Rates, Recommended Care - 1997/98 - 2004/05.

% of people with DM tested						
Age Group	Year	People with DM	Microalbumim	Lipids	A1c	Eye Exams
20-44	1997/98	15,490	16.5%	31.8%	27.2%	38.4%
	2004/05	24,788	34.4%	69.4%	29.0%	28.7%
45+	1997/98	113,624	15.4%	35.3%	40.2%	48.5%
	2004/05	209,489	45.7%	45.4%	84.8%	46.9%

The lipid profile is a group of tests that are often ordered together to determine risk of coronary heart disease. The tests that make up the lipid profile are tests that have been shown to be good indicators of whether someone is likely to have a heart attack or stroke caused by blockage of blood vessels (hardening of the arteries). Along with other risk factors, the levels of lipids as measured by these tests provide a person, in consultation with his or her doctor, with a good estimate of their risk of heart attack or stroke over the next 10 years. The lipid profile includes total cholesterol, HDL-cholesterol (often called good cholesterol), LDL-cholesterol (often called bad cholesterol), and triglycerides. Lipid testing according to the B.C. diabetes management guidelines has increased significantly between 1997/98 and 2004/05 (Table 1). Lipid testing varied by age group with lipid testing more than doubling from 31.8% to 69.4% for people with diabetes ages 20-44 years. In contrast, for those people with diabetes who are 45 years and older, lipid testing increased by 10% from 35.3% to 45.4%.

Microalbumin tests evaluate urine for the presence of a protein called albumin. When the kidneys are working properly, albumin is not present in the urine. Between 1997/98 and 2004/05, microalbumin testing in accordance with the B.C. diabetes

management guidelines has increased significantly (Table 1). Microalbumin testing rates doubles among people with diabetes ages 20-44 years from 16% to 34%, and tripled among those aged 45 years and older from 15.4% to 45.7%. This improvement in testing corresponds with improvements in chronic kidney care that have served to slow progression to end-stage renal disease requiring dialysis treatment.

In order to assess the impact of the Full Service Family Practice Incentive Program on provision of guidelines based care, an analysis was conducted comparing testing rates of patients whose general practitioner had billed the incentive payment for diabetes management according to the B.C. guidelines recommendations versus patients whose doctor did not bill the incentive payment.

As shown in Table 2, patients receiving diabetes care according to guidelines recommendations had very similar age/sex distribution as the whole diabetes population. For example, 49% of diabetes patients are over 65 and 51% of the diabetes incentive payments were billed for people over the age of 65.

Table 2: Incentive Payment Descriptive Analysis by Age Group

	20-44	45-64	65+	Total
% of diabetes patients in each age group who had incentive payments billed.	26%	37%	37%	35%
% of incentive payments billed	8%	42%	51%	100%
% of diabetes patients	10%	40%	49%	100%

After adjusting for other factors contributing to whether or not a patient receives guidelines recommended care (such as age, sex, medication use and presence of other chronic conditions), data analysis indicated that patients whose general practitioner had billed diabetes care incentive payment were:

- 2.5 times more likely to have 2+ A1c tests per year;
- 1.7 times more likely to have microalbumin testing according to guidelines recommendations;
- 3 times more likely to have lipid testing consistent with guidelines recommendations; and
- Slightly more likely (1.1 times) to receive eye exams per guidelines recommendations.

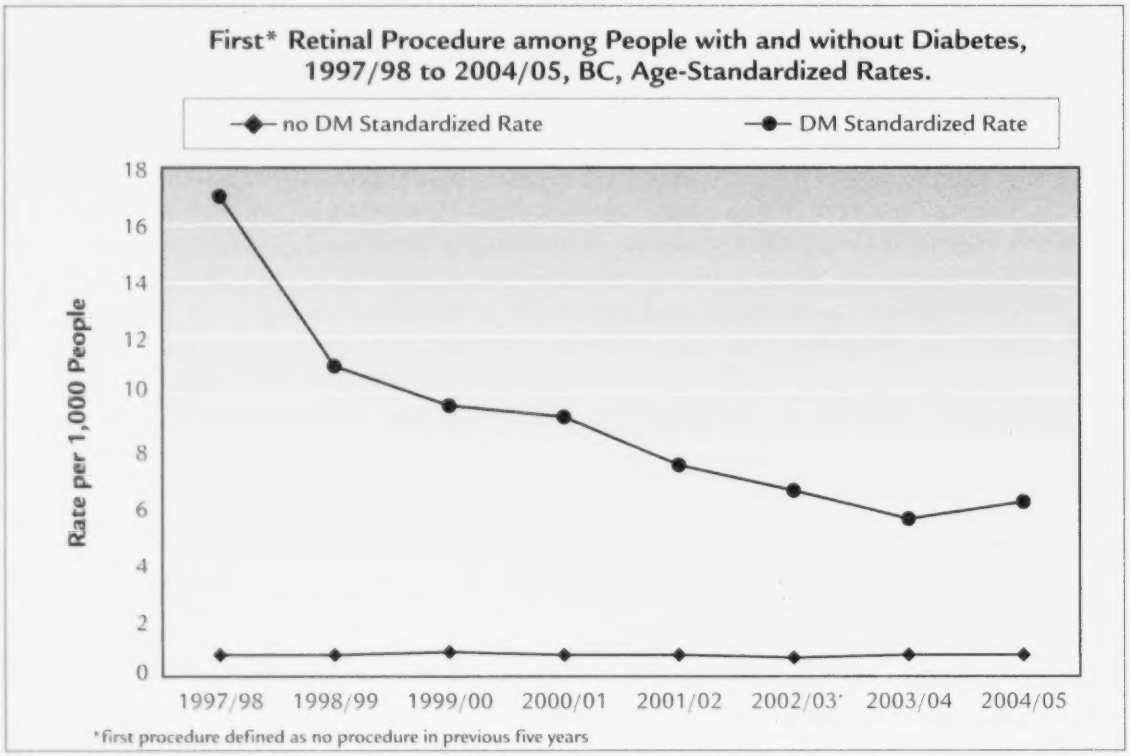
Response from the Ministry of Health

An external evaluation of the Full Service Family Practice Incentive Program has been commissioned by the GP Services Committee. This evaluation slated to commence in Summer 2007 will assess the impact of the incentive payment on diabetes patient outcomes.

Health Outcomes of Receiving Guidelines Recommended Diabetes Care

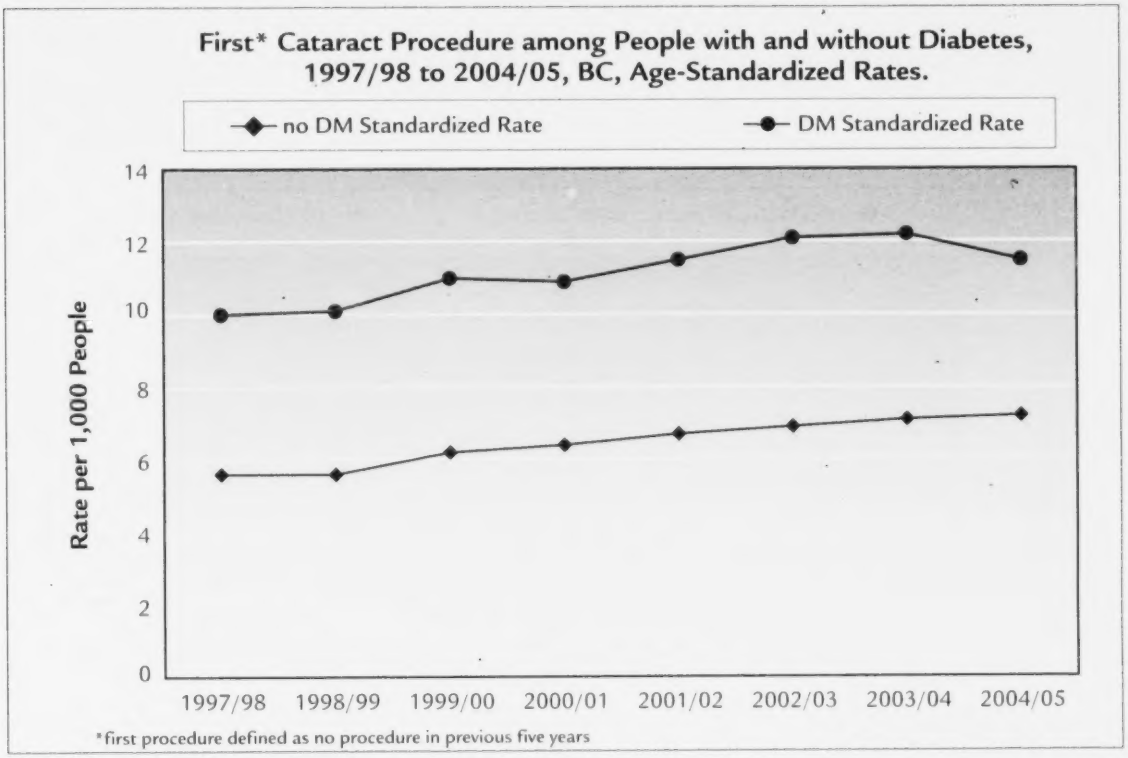
Diabetes is a major cause of blindness in North America, due to a condition known as "diabetic retinopathy." There is good evidence that better control of diabetes can reduce the progression of this eye disorder. As shown in Figure 8, retinal procedures for both men and women of all ages has decreased significantly in the years spanning 1997/98 and 2004/05. People with diabetes experienced a 64% reduction in the rate of first retinal procedures, whereas people without diabetes experienced only a 10% reduction. It should be noted however that the rate of first retinal procedure is approximately 7 times higher in people with diabetes compared to people who do not have diabetes.

Figure 8:



Between 1997/98 and 2004/05 the number of people undergoing surgery for cataracts has increased regardless of whether or not they have diabetes (Figure 9), however, the age-adjusted rates of first cataract procedures have increased 29% for people without diabetes, but only 15% among individuals with diabetes.

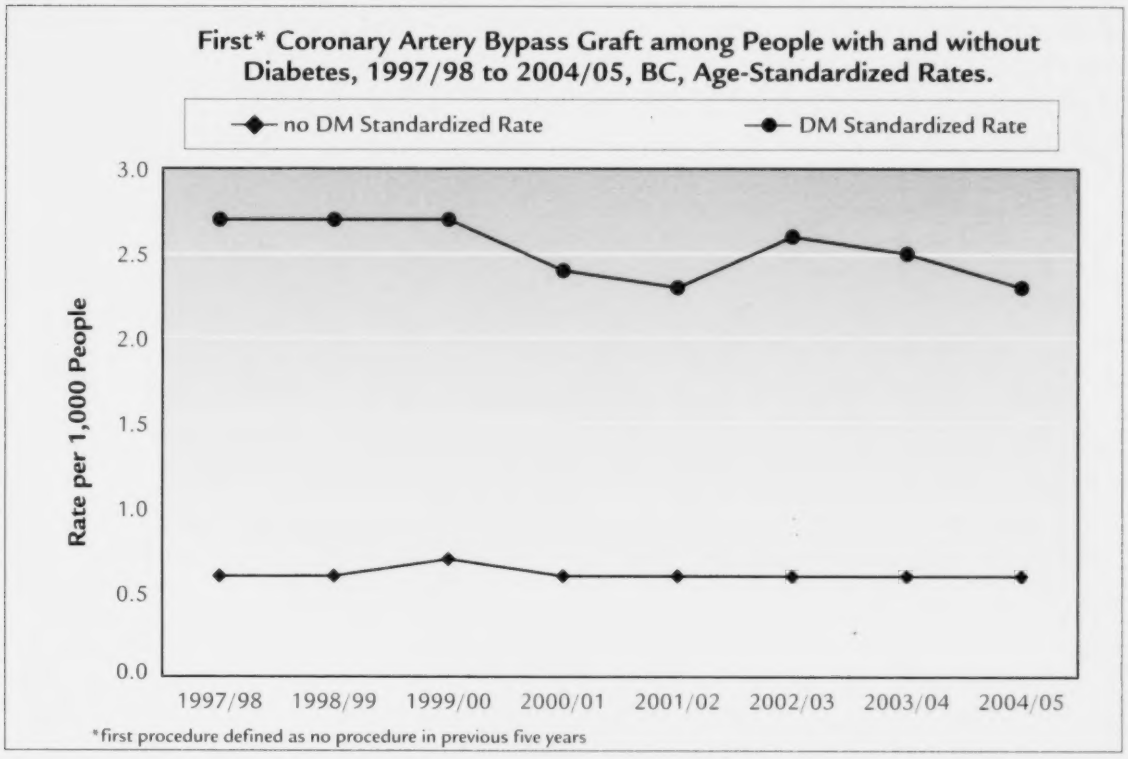
Figure 9:



The number of people with diabetes receiving eye examinations in accordance with B.C. diabetes guidelines has decreased 10% for people 20-44 years. The eye exam rate for people with diabetes 45 years of age and older declined slightly from 48.5% in 1997/98 to 46.9% in 2004/05. The decline began to occur in 2002/03 during which time the Medical Service Plan de-listed eye examinations as an insured service for people who did not have diabetes, although, eye examinations did remain an insured service for people with diabetes. Further investigation is required to understand if some people with diabetes (particularly in younger age groups) did not fully understand the payment policy changes thus resulting in a perceived barrier to accessing eye examinations. Further action clarifying the policy through public education may be required.

The number of people undergoing a coronary bypass graft has decreased over the past 9 years (Figure 10).

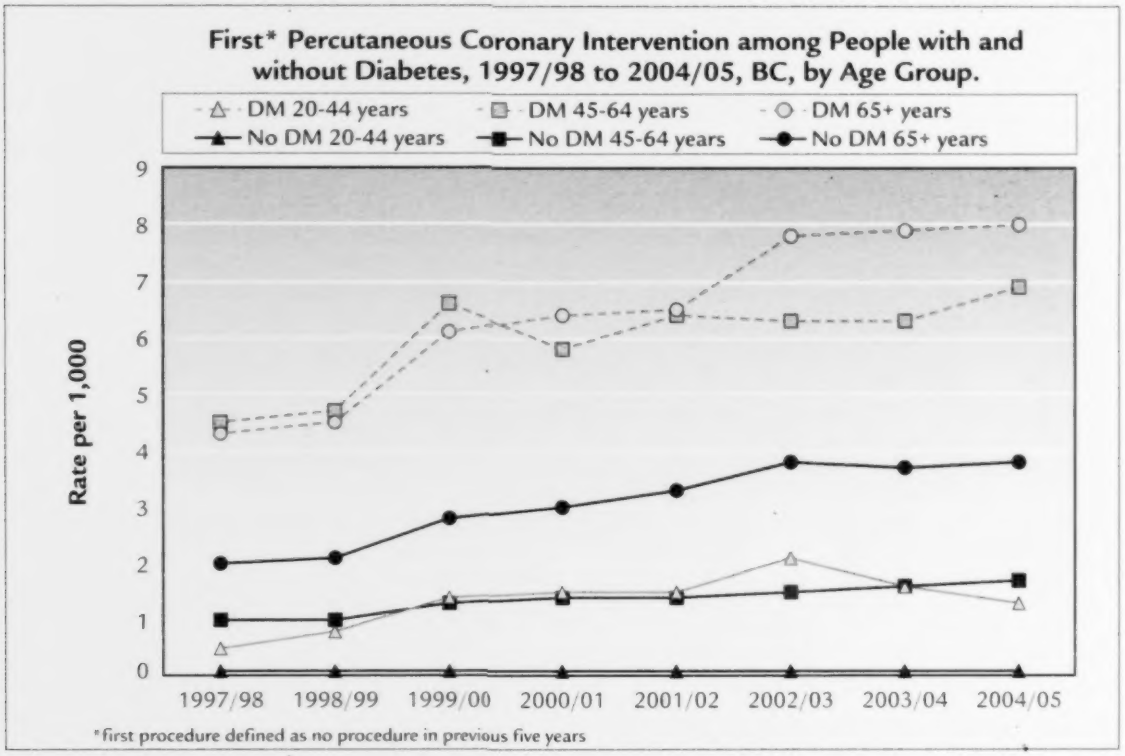
Figure 10:



Percutaneous coronary interventions include procedures such as angioplasty that are used to open up blockages in coronary arteries in a way that is less invasive and safer for patients, and less expensive for the health care system. The increased use of PCA partially explains the reduction in the use of open heart surgery to perform coronary artery bypass grafts.

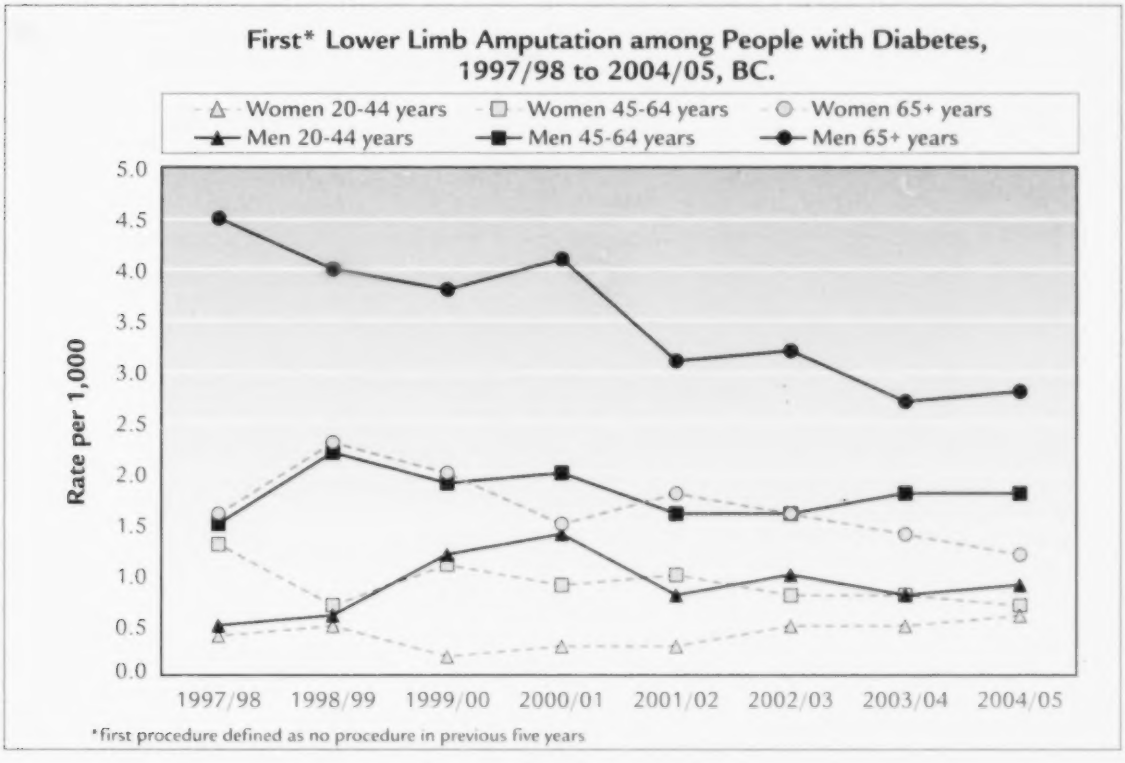
As shown in Figure 11, the number of people with diabetes aged 20-44 requiring percutaneous coronary interventions (PCIs) has nearly tripled in the past 9 years, from .5 per every 1,000 people in 1997/98 to 1.3 per every 1,000 in 2004/05; however, the rates have been declining since 2002/03. Because diabetes is an important risk factor associated with coronary artery disease, people with diabetes were 3 times more likely to require PCI than people without diabetes, after adjusting for age.

Figure 11.



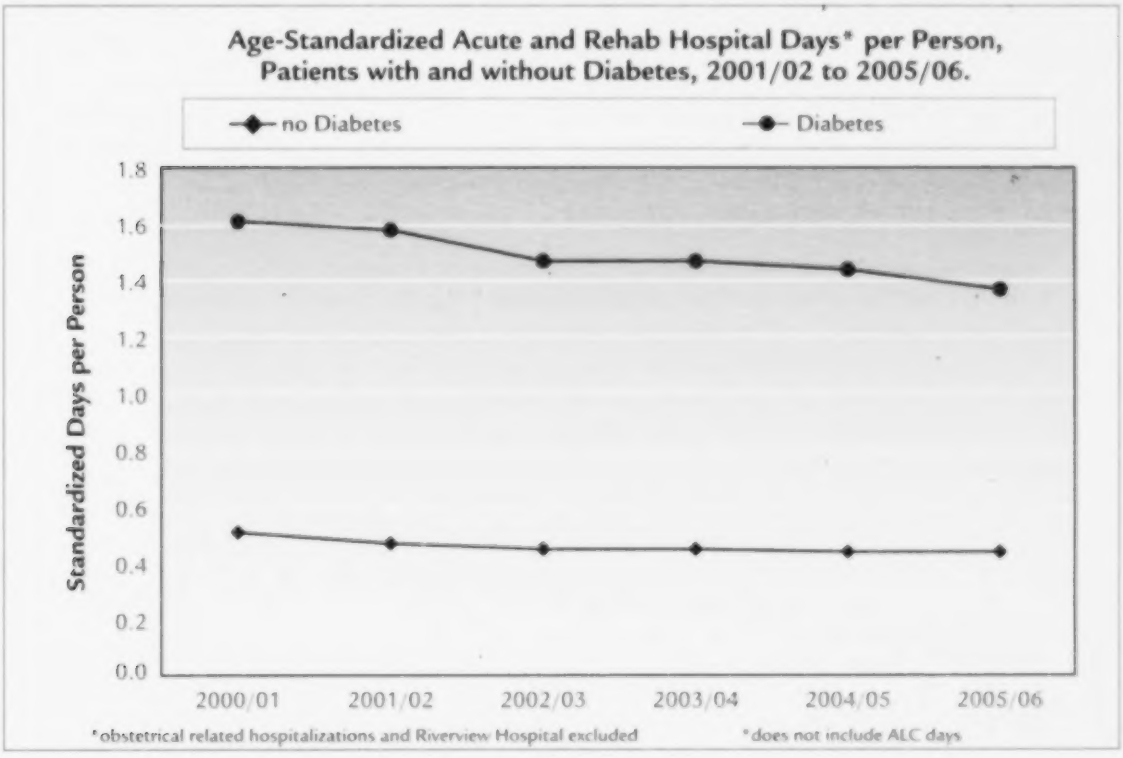
Men with diabetes over the age of 65 are more likely to undergo a lower limb amputation than younger men and women of all ages. As shown in Figure 12, lower limb amputations for men in this age group have declined significantly (by 37%) since 2000/01. Lower limb amputation rates have remained relatively stable among the other age/sex cohorts over the years since 1997/98.

Figure 12:



In terms of acute care utilization, over the past few years the number of hospital days used by people with diabetes has been declining at a faster rate than the number of hospital days for people who do not have diabetes. The decline in the number of hospital days used by people with diabetes is four times greater than the decline for people who do not have diabetes: 24 fewer days for every 100 people with diabetes compared with 6 fewer days for every 100 people without diabetes.

Figure 13


Age-Standardized Acute and Rehab Hospital Days* per Person,
Patients with and without Diabetes, 2001/02 to 2005/06.
no Diabetes
Diabetes
Standardized Days per Person
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
2000/01
2001/02
2002/03
2003/04
2004/05
2005/06
*obstetrical related hospitalizations and Riverview Hospital excluded
*does not include ALC days

Response from the Ministry of Health

We recommend that the provincial government engage in an organized process to:

2. Develop, and provide to Government, well supported strategies for prevention including documentation of the costs and benefits (in medical, social and financial terms) of applying the recommended methods of prevention, and of not doing so.

Status: Partially implemented—Ongoing

1. Evidence points to trends in society related to poor diet, the lack of exercise and continuing use of tobacco amongst other factors as major contributions to the burden of illness. In addition, the changing demographics of our Province with the aging of our population also contribute to the burden of chronic disease. The increasing annual incidence of approximately 25,000 newly diagnosed people with diabetes—the majority of which is Type 2—and partially preventable, is reflective of the society trends toward inactivity and obesity.

2. Responding to the changing demographics and increased incidence of chronic illness in B.C., the *Chronic Disease Prevention Framework* provides a broad strategic overview of the factors that lead to chronic diseases and the range of interventions needed to prevent or reduce their occurrence. This framework along with the Chronic Disease Evidence Paper, documenting costs and benefits, informed the ActNow BC framework which was announced by Government in the throne speech of 2005. The goal of ActNow BC is to improve the health of all British Columbians by addressing the common risk factors for chronic diseases, including diabetes, rather than focusing on one disease, or risk factor, at a time. ActNow BC has been designed to support Government's second great goal to counteract the broader societal trends linked to poor health outcomes, and to set hard targets for improvements. These initiatives will make an important contribution to the primary prevention of diabetes.

3. After the onset of diabetes the health system's aim is to reduce or slow down the consequences of the disease that include, heart disease, kidney failure, amputations and blindness. *Improving Chronic Disease Management: A Compelling Business Case for Diabetes* was developed to identify the potential cost savings that could be accrued through the province-wide identification

of people with diabetes and the implementation of the expanded chronic care model for the management of diabetes. Preventing the complications of diabetes is addressed in the business case, along with projections of health system burden of the disease expected if action is not taken to effectively manage diabetes. MOH initiated the Chronic Disease Management Initiative in January 2002, and further work building on the 2006 MOH/BCMA Agreement will be undertaken over the next four years to further realize the business case.

4. Over the last three years the MOH has provided evidence based recommendations and B.C. data to all major health system stakeholders through the *BC CDM/Quality Improvement Taskforce* to stimulate and mobilize solutions to the complex task of preventing and managing diabetes, thereby mitigating the personal health burden to patients and the very high costs to the system. Providing data in an understandable format has brought these stakeholders to a common understanding with an aligned focus. We have projected the changing demographics showing B.C.'s aging population and the urgency with which we have to test, implement, and evaluate methodologies to prevent and manage all chronic diseases, including diabetes. Effective management of chronic diseases is pivotal to an overall sustainable health system. The active and purposeful sharing of evidence has resulted in committed partnerships for action in B.C. that include the BC Healthy Living Alliance, and the CDM/Quality Improvement Taskforce. The partners agree on the problems and are committed to solutions. This has resulted in the development of the B.C. Primary Health Care (PHC) Charter. The PHC Charter outlines primary health care challenges, identifies priorities and actions, and establishes outcome measures to set the strategic direction of the Ministry of Health with the regional health authorities. One of seven priorities identified in the Charter is chronic disease management which includes the prevention of the complications of diabetes. Developing the PHC Charter collaboratively has resulted in clear direction and priorities that each health authority will translate into its plans, and the Ministry of Health will use in developing its long-term integrated strategic plan for B.C.'s health care system. In addition, the PHC Charter sets out a strategic agenda for other health system key stakeholders who want to align their efforts with a systems approach.

5. As noted previously, data from the Medical Services Plan demonstrated that clinical patterns of practice were not effective in managing chronic conditions. The system, including the models of compensation for primary care physicians, results in the provision of episodic care that was not able to optimize health outcomes for patients living with complex health needs. In order to move providers and patients to a chronic care model that optimizes prevention, empower self-management, and support providers to manage care to best practice recommendations, the work of the Ministry is to align:

   - **Compensation Strategies:** Through the joint Ministry of Health/Medical Association *Full Service Family Practice Program*, general practitioners receive compensation for providing diabetes care according to the B.C. Diabetes clinical guidelines.
   - **Information Technology Strategies:** B.C.'s E-health Strategy will ensure that provincial funded electronic medical records include CDM Toolkit functionality (e.g., register of diabetes patients, diabetes guidelines and flow sheets, patient recall reminders).
   - **Legislation:** Bill 29 (enacted March 2007) introduced changes to the Freedom of Information and Privacy legislation to authorize indirect collection of patient personal health information for the following purposes of managing chronic disease, and for use in health service development, management, delivery, monitoring and evaluation.
   - **Policies:** The Ministry of Health has developed a B.C. Primary Health Care Charter (launched May 2007) to set a Province wide strategic direction for the re-design of primary health care that emphasized patients as partners in their own care.
   - **Service Delivery Models:** Through the implementation of structured collaboratives and the Practice Support Program., B.C. GPs are receiving training and support in re-designing their practice to better enable a proactive, planned approach to chronic disease management including diabetes management.

6. In 2005, Premier Campbell announced the launch of ActNow BC, the health promotion and chronic disease prevention initiative aimed at encouraging British Columbians

to make healthier lifestyle choices to improve their quality of life, reduce their risk of developing preventable chronic disease, and reduce the burden on our health care system. ActNow BC is an integrated approach to chronic disease prevention, meaning that instead of targeting a single risk factor or a single disease category, it targets the risk factors common to the most prevalent chronic disease categories. It is not a diabetes reduction initiative, per se, but by encouraging people to be more active, eat healthier foods and maintain a healthy weight, it will help reduce the incidence of diabetes among the B.C. population. According to *The Impact of Diabetes on the Health and Well-being of People in British Columbia*, the Provincial Health Officer's Annual Report 2004, the prevalence of diabetes is increasing in our province. In 2003/04, more than 200,000 people were living with the disease. Approximately 20,000 individuals are diagnosed every year. It is estimated that without any prevention measures, by the end of the fiscal year 2015/16 over 390,000 British Columbians will have diabetes—a 77 per cent increase in ten years[10]. The government-funded costs for persons with diabetes in B.C. (including hospitalization, Medical Services Plan and PharmaCare) were about $1 billion in 2003/04. If the prevalence continues to rise at the current rate, it is estimated these costs could rise to $1.9 billion by 2015/16—an increase of $900,000,000 (just over 80 per cent). If prevention initiatives can reduce the incidence of diabetes by just 25 per cent, however, annual government-funded costs for persons with diabetes will decrease by $200 million within twelve years. A 50 per cent reduction would decrease annual costs for persons with diabetes by $400 million.[11] See also response to recommendation 1: Strategic Population Health Initiatives:

- ActNow BC
- Core Functions Initiative

[10] *The Impact of Diabetes on the Health and Well-being of People in British Columbia*, Provincial Health Officer's Annual Report 2005, pg 26.
[11] *ibid*, pg 32.

We recommend that the provincial government engage in an organized process to:

3. **Implement the strategies chosen by Government in such a way that they can achieve their optimum effectiveness and be sustained long enough to be effective.**

Status: Partially implemented—Ongoing

1. The Ministry facilitated, and is a funder and non-voting member of the BC Healthy Living Alliance, the goal of which is to improve the health of British Columbians through leadership that enhances collaborative action to promote physical activity, healthy eating, and living smoke free, thus focusing on a wide range of chronic illness including diabetes.
2. In March 2005, the Premier launched ActNow BC, a multi-sector, partnership-based initiative that draws upon the research and resources of all levels of government, non-government organizations, communities, schools and the private sector to create and assist British Columbians in making healthy lifestyle choices to improve their quality of life, reduce their risk of preventable chronic disease, and help create a sustainable health care system in BC. By engaging all sectors of society in creating a health-supporting environment where the healthy choice is the easy choice, ActNow BC broadens the responsibility for population health beyond the traditional health care sector and creates a more sustainable network of health promotion and prevention initiatives that will ensure B.C meets its goal of improved population health over the long term. A list of ActNow BC partners is available at www.ActNowBC.gov.bc.ca. An important and active partner in supporting government's chronic disease prevention strategy (and helping to ensure its sustainability) is the BC Healthy Living Alliance (BCHLA). The BCHLA, formed in early 2003 under the leadership of the BC Ministry of Health, is an alliance of health sector stakeholders who are working together to prevent chronic disease. The nine voting members include the Heart and Stroke Foundation, Canadian Cancer Society, Canadian Diabetes Association, BC Lung Association, British Columbia Recreation and Parks Association, Dieticians of Canada, Public Health Association of BC, Union of BC Municipalities, and the BC Pediatric Society. Non-voting members include the Ministry of Health, the Public Health Agency of Canada, and

the six Health Authorities. BCHLA members individually and collectively lobbied government regarding the need for investments in health promotion and chronic disease prevention. In February 2005 the Alliance released their strategic document *The Winning Legacy – A Plan for Improving the Health of British Columbians by 2010* containing 29 recommendations for actions government could take. In March 2006, Government responded with a $25 million grant to the Alliance to support action on their recommendations. The Alliance has undertaken extensive strategic planning and will be releasing plans for investments aligned with ActNow BC targets and Government's prevention targets in coming weeks, specifically healthy eating and physical activity strategies.

3. MOH has a comprehensive framework for monitoring progress towards ActNow BC targets. Logic models have been developed for ActNow BC and for each ActNow BC target.
4. MOH supported the Provincial Health Services Authority (PHSA) in the planning and development of the BC Population and Public Health Data Evidence Network established to gather, coordinate and interpret key population and public health data and evidence.
5. As part of its renewal strategy for public health, the MOH has adopted *A Framework for Core Functions in Public Health*, which will form the basis for a new Public Health Act. Health Authorities will be required to reflect "Healthy Living—core program paper" in their service delivery system beginning in the 2007/08 fiscal year.
6. The MOH is involved nationally with diabetes surveillance. The diabetes probabilistic patient register developed from the case definition and work developed through participation in the National Diabetes Surveillance System, has been verified through a series of patient surveys.
7. The BC Diabetes Care Guideline developed by the MOH/BC Medical Association (BCMA) includes a recommendation that people over the age of 40 are screened for diabetes. In 2005/06 approximately 85 per cent of people over 40 have had a screening test for diabetes, (i.e., a fasting blood glucose test) in B.C.
8. The MOH/BCMA 2006 Agreement has identified significant additional resources to support expanded activity. It is Government's intention to increase the annual incentive payment for appropriate management of diabetes per patient per year from $75 to $125. The agreement also includes provisions for new resources to address hypertension supported

by new clinical practice guidelines. The guideline includes a management flow sheet, which will be shared with the patient. It is anticipated that a focus on hypertension will make an important contribution to diabetes prevention, because high blood pressure is often associated with the onset of diabetes.

9. Through pilot testing the MOH has identified that optimal chronic care also requires good decision support systems. The Government/BCMA 2006 agreement includes significant investment in B.C.'s e-health strategy, designed to support clinical improvements across the system. e-Health will take the successes of the chronic disease management electronic toolkit, which enables substantial improvements in patient care for people with diabetes and other diseases, and will embed these critical functionalities into Electronic Medical Records (EMRs) which will be available to all general practitioners and specialists in the province. This will spread electronic support and critical decision support from about 700 physicians to a possible 4,000 General Practitioners.

Summary

The data presented show encouraging signs that those persons with diabetes are living longer (reduced mortality) and healthier lives (e.g., fewer progressing to amputations, retinopathy or dialysis) than people of the same age did in the past. There is still room for improvement. MOH has identified the evidence, tested prevention and management methodologies to continue improving the lives of people living with the risk of, or the burden of diabetes. MOH has put in place the key elements of an infrastructure for a province-wide approach to building the capacity of the population to stay healthy and to embed prevention strategies into our communities, schools and workplaces. In addition, MOH has set in motion a major restructuring and re-orientation of the health system away from episodic care to more to effective planned care. Such a major shift requires a combination of legislative changes, effective policy directions and relentless monitoring of results. We are encouraged by the earlier than expected results of the strategies we have enacted, which have shown improved health outcomes for patients living with diabetes. However, MOH and its partners are well aware that initial successes and gains are small and we have a great deal more to do both as a society and a health system. We also understand these efforts must be sustained over the long-term.

Appendices

Appendix A

Timetable of Reports Issued and Public Accounts Committee Meetings on Preventing and Managing Diabetes in British Columbia

October 2004	Office of the Auditor General issues 2004/2005 Report 3: *Preventing and Managing Diabetes in British Columbia*. The report included 3 recommendations.
January 2005	*The Select Standing Committee on Public Accounts* reviews our report.
January 2005	*The Select Standing Committee on the Public Accounts'* review of the report tabled in the Legislative Assembly.

Appendix B

Select Standing Committee on Public Accounts — Legislative Assembly of British Columbia: Guide to the Follow-Up Process

About the Committee

The Select Standing Committee on Public Accounts is an all-party select standing committee of the Legislative Assembly. The committee is currently composed of 14 members, including a Chair and Deputy Chair. The committee is supported in its work by the Office of the Clerk of Committees, which provides procedural advice, and administrative and research support.

The committee's Terms of Reference include, but are not limited to, the following powers:

- Consider all reports of the Auditor General which have been referred to the committee by the Legislative Assembly
- Sit during a period in which the House is adjourned or recessed
- Send for persons, papers and records
- Report to the House on its deliberations.

Committee Meetings

Dates of committee meetings are posted on the Legislative Assembly website at www.leg.bc.ca/cmt/ . Committee proceedings are recorded and published in *Hansard*, which is available on the same website. The Auditor General and the Comptroller General are officials of the committee, and are usually present at committee meetings. During meetings, representatives of the Auditor General's office make a presentation of their audit findings.

Representatives of audited organizations also attend as witnesses before the committee, and provide information to the committee regarding actions taken to address the Auditor General's recommendations. Following each presentation, committee members are provided with the opportunity to ask questions of witnesses. Members of the Legislative Assembly may examine, in the same manner, witnesses, with the approval of the committee.

Appendix B

After initial consideration of a report, the committee often wishes to follow-up the progress made in implementing the Auditor General's recommendations, or recommendations made by the committee to the House, and adopted by the House. The procedures for follow-up reviews carried out by the Auditor General are outlined below.

The Follow-up Process

1. About twelve months after an audited organization's appearance before the committee, representatives of the Auditor General's office will request representatives of the audited organization that a progress update be provided to the Office of the Auditor General within a period of time (usually one month).
2. Audited organizations must prepare a written response in the format noted below, and direct it to the Office of the Auditor General. In drafting the written response, organization representatives may wish to consult with the Office of the Comptroller General, and/or the Office of the Auditor General. As well, the Office of the Clerk of Committees would be pleased to answer any questions regarding the work of the committee, and committee procedure.
3. All written responses submitted by audited organizations are reviewed by the Office of the Auditor General to confirm the fairness of information about the progress made in implementing the recommendations contained in the Auditor General's report.
4. After completion of his review, the Auditor General issues a report to the Legislative Assembly, which includes the Auditor General's opinion on the status provided by the organization. The report is referred to the Select Standing Committee of Public Accounts.
5. Following review of the Auditor General's report, the committee may request that representatives of the audited organization appear before the committee to provide further information, or that further information be provided to the committee in written form.
6. The Office of the Comptroller General will arrange for witnesses to attend where the committee has asked for a presentation based on the written follow-up.

Appendix B

Format of Written Responses

Written follow-up information prepared by audited organizations in response to a request from the Office of the Auditor General should include the following items:

- Date of the written response.
- A brief introduction to and summary of the topic being considered, including a reference to the period during which the audit was conducted, date(s) the audit was considered by the Public Accounts Committee, and how many of the recommendations have been fully implemented, substantially implemented, partially implemented, alternative action taken and no action taken to date.
- A brief response to each recommendation made by the Auditor General and by the Public Accounts Committee (unless specifically advised to address only particular recommendations), including all actions taken to implement each recommendation.
- A work plan for implementation of the Auditor General's and the Public Accounts Committee's recommendations, including information on the means by which each recommendation will be implemented, time frames for implementation, identification of branches with primary responsibility for implementation, and procedures in place to monitor progress in implementing the recommendations.
- Any other information relevant to the Auditor General's or Public Accounts Committee's recommendations, including planned or current projects, studies, seminars, meetings, etc.
- Contact information for ministry/government organization representatives who have primary responsibility for responding to the Auditor General's and Public Accounts Committee's recommendations (name, title, branch, phone and fax numbers, e-mail address).
- The reports are to be signed by a senior official responsible for the area, normally a Deputy Minister, an Assistant Deputy Minister or Vice-President.
- Reports should be relatively brief (e.g. 5-10 pages), although attachments are acceptable. If guidance is needed in preparing the follow-up report, please contact any of the offices noted following.

Appendix B

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Appendix C

Office of the Auditor General: Follow-up Objectives and Methodology

Purpose of Following Up Audits

The Office conducts follow-up reviews in order to provide the Legislative Assembly and the public with information on the progress being made by government organizations in implementing the recommendations arising from the original work. Performance audits are undertaken to assess how government organizations have given attention to economy, efficiency and effectiveness.

The concept of performance audits is based on two principles. The first is that public business should be conducted in a way that makes the best possible use of public funds. The second is that people who conduct public business should be held accountable for the prudent and effective management of the resources entrusted to them.

The Nature of Audit Follow-ups

A follow-up of an audit comprises:

1. requesting management to report the actions taken and to assess the extent to which recommendations identified in the original audit report have been implemented;
2. reviewing management's response to ascertain whether it presents fairly, in all significant respects, the progress being made in dealing with the recommendations;
3. determining if further action by management is required and, consequently, whether further follow-up work by the Office will be necessary in subsequent years; and
4. reporting to the Legislative Assembly and the public the responses of management and the results of our reviews of those responses.

While a follow-up of an audit focuses on progress made, it is not intended to assess whether or not the rate of progress has been satisfactory.

Appendix C

The Nature of a Review

A review is distinguishable from an audit in that it provides a moderate rather than a high level of assurance. In our audits, we provide a high, though not absolute, level of assurance by designing procedures so that the risk of an inappropriate conclusion is reduced to a low level. These procedures include inspection, observation, enquiry, confirmation, analysis and discussion. Use of the term "high level of assurance" refers to the highest reasonable level of assurance auditors provide on a subject. Absolute assurance is not attainable since an audit involves such factors as the use of judgment, the use of testing, the inherent limitations of control and the fact that much of the evidence available to us is persuasive rather than conclusive.

In a review, we provide a moderate level of assurance by limiting procedures to enquiry, document review and discussion, so that the risk of an inappropriate conclusion is reduced to a moderate level and the evidence obtained enables us to conclude the matter is plausible in the circumstances.

Scope of Audit Follow-ups

The follow-ups focus primarily on those recommendations that are agreed to by management at the time of the original audit or study. Where management does not accept our original recommendations, this is reported in managements' responses to the original audit reports. Since our reports are referred to the Legislative Assembly's Select Standing Committee on Public Accounts, management's concerns with our recommendations in some cases are discussed by the committee, which may also make recommendations for future action. If the committee endorses our recommendations, we include them in a follow-up. We also include any other recommendations made directly by the committee.

Frequency of Reporting on Audit Follow-ups

We follow the process agreed to between the Office of the Auditor General, the Office of the Controller General and the Public Accounts Committee (Appendix B).

Appendix C

Review Standards

We carry out our follow-up reviews in accordance with the standards for assurance engagements established by the Canadian Institute of Chartered Accountants.

Methods of Obtaining Evidence

Our reviews involve primarily enquiry, document review and discussion.

Enquiry consists of seeking appropriate information of knowledgeable persons within or outside the entity being audited. Types of enquiries include formal written enquiries addressed to third parties and informal oral enquiries addressed to persons within the entity. Consistent responses from different sources provide an increased degree of assurance, especially when the sources that provide the information are independent of each other.

Document review consists of examining documents such as minutes of senior management meetings, management plans, and manuals and policy statements to support assertions made in management's written report.

Discussion consists primarily of interviews with key management and staff, as necessary, for further verification and explanation.

Office of the Auditor General: 2007/2008 Reports Issued to Date

Report 1 – April 2007

Special Audit Report to the Speaker: The Financial Framework Supporting the Legislative Assembly

Report 2 – June 2007

The Child and Youth Mental Health Plan: A Promising Start to Meeting an Urgent Need

Report 3 – October 2007

A Review of the Vancouver Convention Centre Expansion Project: Governance and Risk Management

Report 4 – December 2007

Follow-up of 2004/05 Report 3: Preventing and Managing Diabetes in British Columbia

The above reports can be accessed through our website at http://www.bcauditor.com